Remarks

Applicants have received and carefully reviewed the Final Office Action mailed July 13, 2007. Claims 5-32 are pending with claims 5, 6, and 10-22 withdrawn from consideration. Reconsideration and allowance of the pending claims are respectfully requested.

Rejection under 35 U.S.C. § 112

Claims 7-9 and 23-32 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In particular, "computer system" is nowhere specified in the disclosure. "To comply with the written description requirement of 35 U.S.C. 112, para. 1, or to be entitled to an earlier priority date or filing date under 35 U.S.C. 119, 120, or 365(c), each claim limitation must be expressly, implicitly, or inherently supported in the originally filed disclosure." (See MPEP § 2163). While Applicant believes that "computer system" has sufficient support in the specification, "computer system" clearly is implicitly or inherently disclosed in the specification as filed and a person of ordinary skill in the art would have clearly understood this. Therefore, for at least this reason, Applicant respectfully requests withdrawal of the rejection.

Rejection under 35 U.S.C. § 101

Claims 7-9 and 23-32 were rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Independent claim 7 recites a computer system operable as a simulator system. As such, claim 7 is believed to recite a physical component or physical device which permits the functionality of the software to be realized.

Furthermore, the Examiner asserts that "device" as used in claim 7 is considered "a software program per se" and provides the IEEE definition for device "(Software) a mechanism or piece of equipment design to serve a purpose or perform a function". However, a mechanism or piece of equipment is believed to be a physical unit or hardware, which is statutory subject matter. Wiley's Electrical and Electronics Engineering Dictionary defines device as "a physical unit or mechanism which performs a specific function or serves a particular purpose. … A

hardware component or subsystem in a computer". Dictionary.com defines a device as "a thing made for a particular purpose; an invention or contrivance, esp. a mechanical or electrical one." As such, "device" is believed to be hardware and thus, statutory. Therefore, for at least this reason, Applicant respectfully requests withdrawal of the rejection.

Rejection under 35 U.S.C. § 103(a)

Claims 7-9 and 23-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Flanigan (U.S. 6,266,428) in view of Wang et al. (U.S. 5,982,486). After careful review, Applicant must respectfully disagree.

Turning to claim 7, which recites:

> 7. (Previously Presented) A computer system operable as a simulator system, the computer system comprising:
> a chemical agent detection environment simulation device;
> a user interface connected to the chemical agent detection environment simulation device;
> a background measurement environment interferogram source connected to the chemical agent detection environment simulation device;
> a numerical computing tool connected to the chemical agent detection environment simulation device; and
> an atmospheric transmittance and radiance model connected to the chemical agent detection environmental simulation device.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). (See MPEP § 2143.03). In the Office Action, the Examiner asserts that Flanigan discloses a simulator system including a chemical agent detection environment simulation, citing column 3, lines 12-15 and Fig. 20 for support. However, Applicant must respectfully disagree.

Flanigan does not appear to teach a chemical agent detection environment simulation, as is recited in independent claim 7. Flanigan appears to teach "a system for detecting and discriminating a hazardous cloud in a field of view" that "provides for real-time imaging of hazardous vapor and aerosol clouds from a sensor mounted on either a static or moving platform." See column 3, lines 41-43 and column 4, lines 49-51. Flanigan also teaches

simulating $\Delta^2 L$ using a 3-layer model, where $\Delta^2 L$ is the difference between radiances actually induced by a cloud. See column 6, line 66 through column 7, line 1.

In the Office Action, the Examiner cites column 3, lines 12-15 and column 4, lines 40-47 as teaching the chemical agent detection environment simulation. These passages recite:

> An object of the invention is to provide a system and method for remote detection of hazardous clouds (vapors and aerosols) that avoids the above-noted deficiencies of the related art.
>
> The present invention finds utility in the imaging of clouds composed of hazardous vapors or aerosols in situations where a high level of importance is placed on detection and warning, such as chemical warfare defense or protection of civilians in the wake of chemical plants. The invention finds further utility for emergency management in hazardous spills and for monitoring suspected terrorist activities, drug processing, and chemical manufacturing.

Nowhere does this appear to suggest the claimed chemical agent detection environment simulation.

Furthermore, the Examiner acknowledges that Flanigan fails to disclose a background measurement environment interferogram source, but asserts that it would have been obvious to one of ordinary skill in the art to combine the teachings of Wang et al. with Flanigan because it would have been convenient to use a background measurement environment interferogram source such as the FTIR spectrometer taught by Wang for the system of Flanigan to remotely detect and discriminate hazardous clouds in a field of view. However, Applicant must respectfully disagree. "The prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...." *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004). As such, it appears that a disclosure that criticizes, discredits, or otherwise discourages the solution claimed constitutes a teaching away from the claimed invention. Accordingly, it appears that Flanagan teaches away from the combination of FTIR spectrometer as taught by Wang because Flanagan appears to criticize the use of, or teach that it is disadvantageous to use, FTIR sensors/systems. To illustrate at least some of these deficiencies of FTIR sensors, Flanagan recites:

> Conventional passive infrared spectroscopy for the remote detection of chemical agents was first proposed in the 1950's. It was recently brought to fruition with the type classification of the U.S. Army's M21. The M21 uses a conventional Fourier transform infrared (FTIR) sensor to produce a spectrum from which a decision is made on the presence or absence of a chemical agent cloud. In passive infrared spectroscopy, all useful information is contained in a small difference spectrum between the "clean" reference spectrum and the contaminated spectrum.
>
> The M21 uses a conventional procedure to establish a difference spectrum based on measuring and recording a reference spectrum in an assumed clean environment and recursively updating it. The problem has been finding a recursive weight that does not have either too many false alarms or too few detections. (Other suggestions have included the operator swiveling the sensor to an area assumed to be clean and measuring a reference spectrum). The M21 scans seven separate, discontinuous FOV's (each of 1.5.degree. by 1.5.degree. separated by 10.degree. center to center), but does not produce an image. There are several proposed FTIR concepts that use arrays of detectors in the image plane of the interferometer, but these produce relatively conventionally sized images that are insufficiently large to form an image of a realistic threat cloud and/or insufficient etendue (throughput limited by the detector, the interferometer, the collector or the cloud size) for good sensitivity.

(Column 1, line 62-column 2, line 22). Flanagan also recites:

> An object of the invention is to provide a system and method for remote detection of hazardous clouds (vapors and aerosols) that avoids the above-noted deficiencies of the related art.

(Column 3, lines 12-15). As can be clearly seen, Flanagan teaches away from using an FTIR sensor/system due to these deficiencies. Instead, Flanagan recites:

> a system for detecting and discriminating a hazardous cloud in a field of view, the system comprising: detector means for (i) taking a first $\Delta^2 L$ spectrum in the field of view at a first spectral resolution and (ii) taking a second $\Delta^2 L$ spectrum in the field of view at a second spectral resolution which is higher than the first spectral resolution;

(Column 3, lines 41-47). As can be seen, Flanagan appears to teach advantages of using a system based on $\Delta^2 L$ spectrum measurements instead of conventional FTIR systems, such as that taught by Wang et al. Applicant respectfully submits that because of Flanagan's teachings

regarding the disadvantages of the FTIR systems, there is no motivation or suggestion in the art for the skilled artisan to combine the teachings of Wang et al. with Flanagan as Flanagan appears to teach away from such a combination.

Additionally or alternatively, there appears to be no motivation or suggestion to combine the teachings of Flanigan and Wang. MPEP 2143.01 III states, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)… Although a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.' 916 F.2d at 682, 16 USPQ2d at 1432.)." Nowhere do the references appear to teach or suggest the desirability of the combination. On page 10 of the Final Office Action, the Examiner states, "[t]he motivation for doing so would have been convenient to a background measurement environment interferogram source such as FTIR spectrometer, as taught by Wang et al, for system of Flanigan et al to remotely detecting and discriminating hazardous clouds in a field of view". However, as discussed previously, Flanigan appears to teach the disadvantages of the FTIR spectrometer. Clearly, teaching the disadvantages of the FTIR does not suggest the desirability of the combination, as is required. Therefore, for at least these reasons, claim 7 is believed to be patentable over Flanagan in view of Wang et al. and Applicant respectfully requests withdrawal of the rejection.

Regarding clam 23, neither Flanagan nor Wang et al. appear to teach a simulated sensor output. The Examiner cites column 11, lines 49-56 and column 12, lines 6-10 of Wang, which recite:

> The alternative reference spectrum which is selected has a much higher concentration-pathlength level, for example, 1000 ppm-m, and more closely simulates the saturation condition existing in the environment. The alternative reference spectrum is now used in the quantitative analysis preferably employing a CLS method from which is generated a new concentration-pathlength product (CL) and MDL.
>
> spectrum. The data from the quantitative analysis step, i.e., the various concentration-pathlength products and MDL's for each of the reference spectra are

> then compared, and the data which most closely fits the expected CL product and MDL is chosen for output.

Nowhere does this appear to teach a simulated sensor output. Instead, it appears to teach choosing an output according to the data which most closely fits the expected CL product and MDL.

Regarding claim 31, neither Flanigan nor Wang et al. appear to teach a sensor response removal module. Instead, the detector array of Flanigan appears to be two detectors used in tandem, but does not appear to provide a sensor response removal module. The Examiner cites column 13, lines 60-63 of Wang et al., which recites:

> is shown in FIG. 12. The signal processing procedure consists of bias removal, phase error correction, computing absorption spectrum, CLS quantitative analysis and final detecting of chemical agents. The outputs of the signal processing procedure are the detection (including CL and MDL) and false alarm probabilities.

Nowhere does this appear to teach a sensor response removal module.

For at least the reasons set forth above, the combination of Flanagan and Wang et al. does not appear to teach or suggest the elements of the clams. As such, Applicant respectfully requests withdrawal of the rejection.

Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-677-9050.

Respectfully submitted,

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